

NAVAL MEDICAL RESEARCH AND DEVELOPMENT NEWS

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Navy Surgeon General Tours Naval Health Research Center

SAN DIEGO – Vice Adm. Mathew Nathan, Navy Surgeon General, visited the Naval Health Research Center (NHRC) in San Diego while in town for the change of command at the Naval Medical Center San Diego. December 4.

Nathan met with command leadership and research staff and was presented overview briefings by Capts. Jacqueline Rychnovsky, NHRC commanding officer, and Lanny Boswell, NHRC executive officer. The visit was timely in that it allowed the surgeon general to review NHRC's 2014 Strategic Plan which will focus on the priorities of Value, Visibility and Collaboration.

"Concentrating on these priorities in 2014 will allow NHRC to demonstrate our relevancy to Navy R&D and to promote our unique mission of optimizing the operational health and readiness of our armed forces as we transition into the Defense Health Agency research organization" said Rychnovsky,

The Surgeon General toured warfighter performance and operational infectious

disease labs, and received briefings on NHRC efforts in the behavioral sciences, deployment health issues, and medical modeling and simulation for forward deployed logistics and capability support.

Nathan encouraged the scientists to continue interacting with others, both inside and outside the organization, to continue generating new ways to solve our problems

Dr. Marc Taylor, an NHRC researcher, said, "The SG was engaging, personable, and intensely supportive of our work. It was especially rewarding to know that our analyses regarding leadership satisfaction and mental health have been utilized by the SG himself to brief Marine Corps leaders regarding the importance of sound leadership."

Nathan told the staff he was impressed with NHRC's work and that their efforts were making a difference.

"The sense of passion you have for your work here is palpable", Nathan said. "You are unsung heroes in the areas of health and readiness."



Vice Adm. Matt Nathan (far right) with Capts. Jacqueline Rychnovsky and Lanny Boswell (NHRC Command and Executive Officers) and Dr. Karl Van Orden (Director of Research) during NHRC presentations.

NMRC Commanding Officer's Message

I want to offer all of you, from my family to yours, the warmest wishes for a happy holiday season filled with good health, happiness and success. Your efforts are greatly appreciated and it is important for you to know you are making a difference in the health and wellbeing of our operational forces. It is important to let our warfighters know we are all indebted to them and their families and grateful for their selflessness and commitment to America's security. During this holiday season, take advantage of every opportunity to relax and reenergized and spend time with family and friends. Holidays are a joyful time of year, but they can also be a time of competing demands and long to-do lists that can lead to high stress levels. During these end of year holidays there are more cars on the road, more people at the malls, and more confusion than any other holiday. So when driving, make safety your number one job. Before leaving for a shopping spree or a family reunion out of town make sure your car is holiday safe. Stay alert for the driver who has over-celebrated, more than half of the automobile accidents that occur during holidays involve people who have been drinking. If you are traveling great distances – long days at the wheel can include night driving and that takes a toll on the very best drivers. Preplan your trip, don't overload your car or obstruct the view, follow other vehicles at a safe distance, always buckle your seat belts, use child-safety restraints, and secure your pets inside the car. Expect the unexpected from pedestrians.



NMRC Commanding Officer sends,
John. W. Sanders III, CAPT, MC, USN

NAMRU– Dayton Commanding Officer's Message



This past October marked the third year anniversary of Naval Medical Research Unit Dayton (NAMRU-D). It is a tremendous responsibility to be Navy Medicine's world class, global aeromedical and toxicology research leader. Our efforts and innovative products continue to be aligned with operational requirements to solve the naval and joint warfighter challenges of the future. The unmatched professionalism, dedication, and expertise of the NAMRU-D team are commendable and impress me daily. I am truly honored and privileged to be given the opportunity to lead such a fine group and extend my sincere appreciation and gratitude to all of the command staff and higher headquarters for the essential support and guidance. Despite fiscal uncertainty across the DoD and the many challenges facing research and development, I am confident in the skills and experience of our team to produce unique capabilities and solutions that will make a difference in warfighter performance and survivability. Our toxicology capabilities include cutting edge *in vitro* programs, nano particle research, and one-of-a kind inhalation facilities (largest in DoD), all with applications to real world threats. Current work is focused on the health effects of jet fuels, particulate matter and burn pit emissions, and the expansion of our *in vitro* model systems and inhalation capacities. Aeromedical capabilities are diverse, innovative, and all operationally relevant. The current top research work mirrors the Commander, Naval Air Forces (CNAF) top priorities of spatial disorientation, fatigue, and hypoxia mitigation. Specifically

recent accomplishments include: Identification of persistent cognitive effects post-hypoxic exposure, the development and testing of several in-cockpit hypoxia detection sensors, and development and validation of several simulation- and visually-based spatial disorientation illusions to be incorporated into NAVAIR training systems. In addition, the Disorientation Research Device is scheduled for final government acceptance March 2014. Even in these difficult times and manned at only 50percent, NAMRU-D is developing innovative methods to expand capabilities and deliver high quality products on time and on target. The pursuit of jointness is becoming more of a reality in our missions. With the colocation of the 711th Human Performance Wing and NAMRU-D at Wright-Patterson Air Force Base, we take advantage of the opportunities to collaborate on ideas, joint research efforts, and share resources and talent all focused on maximizing our warfighter's performance and survivability. Visits to outside Army and USAF research units and active participation in joint service working groups is ongoing and will continue as NAMRU-D climbs, rolls, and booms into the future. Happy Holidays.

NAMRU-Dayton Commanding Officer sends,
Jeffrey M. Andrews, CAPT, MSC, USN

AFRICOM Helps Regional Militaries Fight HIV/AIDS

By Donna Miles, American Forces Press Service

WASHINGTON – U.S. Africa Command is making headway in helping militaries across Africa confront the HIV/AIDS epidemic through a program focused on prevention, care, and treatment, a senior command official reported.

“The whole focus is to reduce the incidence of HIV in foreign militaries,” Mike Hrshchyshn, chief of humanitarian and health activities for Africom’s Security Cooperation Programs directorate, said during a web chat commemorating World AIDS Day.

The office oversees the strategic direction of the Defense Department’s HIV/AIDS Prevention Program in Africa. Of more than 70 nations that participate in the DoD program, 45 are in Africom’s area of operations, Hrshchyshn reported.

HIV and AIDS represent a potential threat to Africa’s regional security and stability, he said. The disease weakens national governments and economies and erodes the readiness of their militaries.

That degrades their effectiveness, not just within their own countries, but also in their ability to provide peacekeeping forces that support regional stability, he explained.

“Without militaries that are able to discharge their missions, ... security starts to degrade,” Hrshchyshn said. “And not only does it have an impact on that specific country but also on a regional basis, beyond their borders.”

This vulnerability could provide opportunities for others to exploit in destabilizing ways, he said.

Since Africom’s standup five years ago, it has focused heavily on regional outreach through its Partner Military HIV/AIDS

Program. The program’s goal is to help regional militaries reduce the incidence of HIV and AIDS within their ranks.

The effort, provided with strong support from the Naval Health Research Center in San Diego working in lock-step with embassy country teams, has been highly successful in increasing awareness about HIV/AIDS and ways to prevent it, Hrshchyshn reported.

The effort has reached nearly a half-million troops and their family members with educational programs about prevention and treatment, provided about 4,000 healthcare workers trained in HIV/AIDS care and treatment, and provided support to about 75,000 people living with the disease.

But Hrshchyshn said the impact goes far deeper, with every person who receives education and training amplifying the message through their daily personal and professional interactions. “They become force multipliers in reducing the transmission of HIV/AIDS,” he said.

Recognition of the consequences of the disease -- and successes in confronting it -- makes nations eager to work together to confront it, he noted. Partner nations share state-of-the-art developments regarding HIV and AIDS during biennial conferences sponsored by DOD’s HIV/AIDS Prevention Program. The most recent one, hosted by Mozambique in 2012, attracted representatives of 70-plus militaries from around the world. “That

reflects the large global interest,” Hrshchyshn said.

That outreach is bearing fruit. “We have made considerable progress,” Hrshchyshn said. He noted one country that was losing two to three soldiers a day to AIDS at the program’s inception. Today, that figure has dropped to about one loss every 10 days.

“That gives you an idea of how dramatic the impact [has been] in reducing mortality,” he said. “The impacts have been considerable, across the board.”

Although the extent of the problem may be diminishing, Hrshchyshn said it’s too soon for Africom to declare success. “This is an area of focus we won’t take our eyes off of,” he said. “It will take a while, but I think we are on a solid path.”

As the United States assists African partner nations, its ultimate goal is “to build up the capacity and capability of our partners so they can take this issue on,” he said.

“They are best positioned in terms of sustainability,” he said. “So it is important that, whether it is on the military side or the civilian side, that they have been able to take the tools, the techniques, the technical assistance that we have provided [and] to mold that to their own cultural environment and then to ... effectively design services to their citizens.”

Those efforts will pay off through “ready, able, healthy and well-trained African militaries that can do their part on the continent to provide a safer and secure environment” to support peacekeeping efforts and to reduce the likelihood of conflict, he said.

Naval Health Research Center ’s HIV/AIDS Programs

SAN DIEGO —The Naval Health Research Center’s (NHRC) HIV/AIDS Prevention Program department’s mission is to reduce the incidence of HIV/AIDS among uniformed personnel in select African nations and beyond. The DoD HIV/AIDS Prevention Program (DHAPP)

assists in development and implementation of military-specific HIV prevention programs and integration with other U.S. Government agencies, nongovernmental organizations, and United Nations programs. As Executive Agent, the DHAPP Management Office at NHRC

provides day-to-day direction of the DoD effort to foreign militaries in over 70 countries worldwide. It prepares and delivers periodic reports and provides the results of assessments to each country’s Deputy Assistant Secretary of Defense.

'Buenos Vientos y Mares Siguientes' for NAMRU-6 CO

By Lt. Carlo J. Traverso, NAMRU-6 PAO



Capt. David B. Service (Commanding Officer, U.S. Naval Medical Research Unit No. 6) gets piped aboard during his change of command ceremony, November 22, 2013. (NAMRU-6 photo by Monica Barrea)

Callao, Peru – There comes a time at the end of every Naval Officer's military career to hang up the uniform and start a new chapter in life. For Capt. David B. Service, Commanding Officer of the U.S. Naval Medical Research Unit No. 6 (NAMRU-6) that transition began with a change of command ceremony, followed by a retirement ceremony, November 22, 2013, that culminated 31 years of faithful military service to this great nation.

A multitude of distinguished guests participated in the long awaited ceremony, to include the U.S. Embassy Lima Chargé d' Affaires, the Honorable Michael Fitzpatrick; Rear Admiral Eduardo Novoa, Peruvian Navy Surgeon

General; General Jorge Veliz, Peruvian Army Surgeon General; Major General Fermin Vera, Peruvian Air Force Surgeon General; Senior Defense Official/Navy Attaché Capt. John Ries, and Commanding Officer Naval Medical Research Center, Capt. John Sanders and other participants.

Service's speech emphasized his humbled beginnings as an Alaskan fisherman, where he met his wife of over 30 years, Mrs. Betsy Service. They have two grown children Capt. Kyle Service, USMC, and daughter Katherine Service. Son of a Navy Vice Admiral aviator and a first generation American, Service began his Naval journey at the Officer

Candidate Aviator School (AOCS) in Pensacola, Florida where he received his commission as an Ensign in 1985. Following completion of AOCS, he earned his wings as a Naval Flight Officer subsequently serving as a bombardier/navigator on the A-6E 'Intruder.' He then transferred to the Medical Services Corps as a redesignated Naval Aerospace Physiologist.

His diverse background afforded the right mix of military acumen, strategic vision and diplomatic and interagency skills to lead NAMRU-6, as the first selected screened Commanding Officer.

Remarks from Capt. David B. Service, MSC, USN

NAMRU-6 Change of Command

LIMA, Peru – The change of command ceremony has no meaning unless conducted in the presence of the people who are members of the command, so without exaggeration, this ceremony is for you. Today's formal ceremony dramatically and visibly reinforces the fact that the U.S. Naval Medical Research Unit No. 6 (NAMRU-6) is a military command, not just a medical research laboratory.

Irrespective of which country a military serves, the core purpose of a country's armed forces is to protect and defend their countrymen using force. Given the obvious absence of weapons and other tools of war here, it is not uncommon for people to wonder what our conflict is here in this enclave on this beautiful navy base in Callao that has been NAMRU-6's safe harbor for 30 years.

What battle could we possibly be fighting? The startling answer is that NAMRU-6 and our allies are engaged in the long war against debilitating infectious diseases. These diseases have killed more people than all the bombs dropped and all the bullets fired in all the wars ever fought by man. These diseases constitute an enemy that has no respect for borders or treaties, and is more tenacious and ruthless than any human foe.

Our defensive strategy requires agility to respond to changing tactics and capabilities, such as a pathogen's resistance to long established drugs and therapies or a transmutation that allows it to jump from one species to another. Our strategy requires regional allies, a militia made up of expert Latin American partners engaged in protecting their homeland here on the front lines where enemy diseases infiltrate the communities and jungles.

This long war requires battle-hardened veterans and strong young recruits who have the tenacity, drive, intelligence, and courage to pursue the fight, even in the face of odds that would weaken the

resolve of many warriors. The enemy includes pandemic threats such as influenza that can overrun a nation like an invading armada. Respiratory infections that kill more than half the people they come in contact with and fanatical extremists such as dengue, malaria, and rabies that refuse to surrender even after hundreds of years of opposition.



How do we assemble a crew willing to sail into battle in the face of such adversity? In the U.S. Navy military structure, NAMRU-6 operates like a Ship of the Line, and like a ship it is made up of Departments and Divisions that each contribute to the combat capability of the vessel. Each is a vital element and none can accomplish its own specialized function without the mutual support of the other elements that are also part of the ship. On the NAMRU-6 ship, the crew is made up of dedicated Peruvians and Americans who are the best and most highly skilled people available. At the core of every ship is the Operations Center, and at NAMRU-6 the mission, the operation, is tropical disease research. Those operations are executed by an incredibly talented group of dedicated scientists and technicians who are among the best in the world at what they do.

Our bacteriology team is led by Lt. Cmdr. Hamilton Tilley, an accomplished Navy physician and fleet-seasoned officer with

an unlimited capacity for extra work. Our emerging infections department (EID) headed by Dr. Dan Bausch is the equivalent of a multi-warhead missile. His EID team goes against multiple targets at the same time by responding to outbreaks, monitoring and analyzing disease activity, and pursuing pathogen discovery in a myriad of vectors, including small furry rodents.

All ships wage an ongoing battle against pests, including insects, and NAMRU-6 is no different, except that our fight extends well outside the ship's life lines and into the jungle. Led by Cmdr. Fred Stell and Dra. Gisella Vasquez, the command's crack entomology team excels at capturing and studying the mosquitoes and flies that transmit force-crippling diseases such as Dengue and leishmaniasis. Closely aligned is the parasitology team headed by Dr. Will Lescano and Lt. Vince Gerbasi. In addition to the world-wide campaign they wage against Malaria, I also consider Willy to be NAMRU-6's de facto Navy Academy Superintendent. His leadership in developing extensive scientific training programs helps ensure a steady influx of up-and-coming epidemiologists and technicians to join the fight across Peru and Latin America. Our virology program is a disease juggernaut of our operations. The virology team of special forces investigators includes renown experts.

No ship goes anywhere without a navigator and NAMRU-6 is incredibly fortunate to have a Science Director as esteemed as Dr. Claudio Lanata to help plot its course. With his experience in international waters and steady hand next to mine on the rudder we safely navigated regulatory reefs and political shoals while charting courses to new research opportunities across Latin America.

My ship's Squadron and Fleet commanders are here on the quarterdeck with me today, Capt. John Sanders

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Disease Surveillance in Cambodia

By Wattanak Heng and Agus Rachmat, Data Analysis Department, NAMRU-2 Phnom Penh



Lt. Gavin Ford, LTC. Song Chiv (Department of Health, Cambodia MoND), Mr. Wattanak, Mr. Agus Rachmat with all reporting sites officers under RCN at Ream Naval Base, Sihanoukville.

PHNOM PENH, CAMBODIA - Since the beginning of 2011, the U.S. Naval Medical Research Unit No. 2 Phnom Penh (NAMRU-2 – PP), in collaboration with the Department of Health, Cambodia Ministry of National Defense (MoND), developed a disease surveillance system using SMS (Short Message Service) technology.

This system, used to detect health problems occurring at military bases of the Royal Cambodian Armed Forces (RCAF), is very simple. The medical officer at a reporting site sends an SMS/text message, in a specified format, to another medical officer at a main station daily. Officers at the main station receive all SMS/text messages using a Smart Phone and compile the information into a datasheet format by using RapidAndroid software. The data from the smart phone is transferred to a computer with the Electronic Surveillance System for the Early Notification of Community - based

Epidemics (ESSENCE) developed by the Johns Hopkins University Applied Physics Laboratory (JHU / APL). Officials at the Headquarters Office, of the RCAF Dept. of Health, receive the data sheets weekly, which allows for the analysis and subsequent mitigation of potential disease outbreaks.

In June 2011, an agreement was reached to conduct a pilot project at 10 sites under RCAF Region 3 which includes the provinces of Kampong Speu, Takeo, Kampot, Kep, Sihanoukville and Koh Kong. There are 15 diseases on the list namely: acute diarrhea; acute fever with rash; acute flaccid paralysis; acute lower respiratory tract infection; dengue fever or dengue hemorrhagic fever; meningitis or encephalitis; acute jaundice, diphtheria, rabies, neonatal tetanus, body injuries, burns and corrosions; poisoning by drugs, medicaments and biological substances; suspected radiation; and unknown disease

occurring in a group of people at same place and time.

In addition there are two types of medical conditions included - sick in quarters (SIQ) and consultation. The initial pilot project showed very positive results, so much so, that by August 2011, this diseases surveillance system was installed formally.

The system has been such a success, that over the past year, the Cambodia MoND expanded the surveillance area adding more reporting sites which include the Royal Cambodian Navy (RCN) area of responsibility. The goal is to capture emerging diseases in RCN military bases in the Kampong Som group of islands and on the mainland. To accommodate the island sites, one more disease was added to the list, malaria, bringing the total number of diseases on the list to 16.

As of December 2013, the SMS surveillance project is actively collecting data from 33

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NAMRU-3 Trains Iraqi Scientists on Outbreak Surveillance

By NAMRU-3 public affairs



Ms. Myriam Morcos, far right, from the U.S. Naval Medical Research Unit No. 3 conducts bionumeric training for Iraqi Ministry of Health laboratorians.

CAIRO - Part of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) Global Disease and Detection Program's (GDDRP) mission is to conduct disease outbreak investigations. NAMRU-3's Myriam Morcos, a molecular biology technologist, recently trained scientists from the Iraq Ministry of Health on PulseNet, a tool to assist epidemiologists determine where outbreaks are in days rather than weeks.

"NAMRU-3's role in Pulsenet Middle East is exemplary. We have the equipment and facilities that enable us to provide training and we are here to assist," said Morcos, who recently received an award from CDC for her training accomplishments in the region. "This training is a good start for

Iraq, which will need to get the correct machines to implement the program."

The five Iraqi trainees came from different scientific backgrounds, but all were extremely interested and applied themselves to learn both aspects of the program.

The training focused on this interactive network for foodborne disease surveillance. PulseNet comprises two concepts - the use of pulse field gel electrophoresis (PFGE) on disease-causing bacteria isolated from patients and bionumeric software data analysis. PFGE is done by following standardized procedures strictly developed by CDC. The results are run on an electrophoresis machine that deals with large molecular size DNA to produce patterns that are "fingerprints" of isolates. The machine

generates patterns and these images are uploaded to bionumerics and databases are created. If epidemiological links are found between cases, then a cluster is classified as an outbreak.

NAMRU-3 worked with WHO for over six months to arrange for the Iraqi scientists to come to NAMRU-3. Although Iraq is not a member of PulseNet, representatives participated in yearly collaborative meetings where refresher training was given. Morcos is the technical focal point for Pulsenet Middle East (PNME), headquartered in Oman. Jordan, Palestine, Lebanon, Egypt, Morocco, Libya, Kuwait and Iran currently participate in the program. She has been training laboratorians from these countries since 2007.

PulseNet Middle East was established in 2006 as a molecular surveillance network for foodborne infections to support the Food Safety regional plan and promote technical collaboration between countries. The network includes public health laboratories and academic and medical institutions from 10 countries in the Eastern Mediterranean Regional. A goal of PulseNet Middle East is to enhance communication between laboratories and epidemiologists to increase collaborative efforts and develop action plans to strengthen national foodborne disease surveillance and response programs. <http://www.pulsenetinternational.org/networks/middleeast/>

NMRC Researcher Speaks at University of Notre Dame to Collaborate on Portable Nanosensor Diagnostics

SILVER SPRING, Md. - Dr. Shuenn-Jue Wu, a senior scientist at the Naval Medical Research Center (NMRC), attended a planning meeting at the University of Notre Dame for a National Science Foundation (NSF) proposal for an Engineering Research Center (ERC) for Portable Nanosensor Diagnostics (PANDA).

Contingent on NSF funding, the center will explore nanotechnologies as diagnostic systems for public health and water quality monitoring in low-resource settings such as developing countries, rural clinics, and military operational environments.

Notre Dame sought Wu's expertise in viral and rickettsial diseases and would like to include DoD OCONUS laboratories as a global test bed for infectious disease diagnostics relevant to military personnel. Wu's participation in PANDA potentially enables the DoD to guide and influence critical technology development.

PANDA has the potential to develop diagnostic devices with price points and efficacies that can solve sustainability concerns, especially for militarily relevant diseases with a small U.S. market. Wu hopes to integrate promising and suitable products developed by PANDA into NMRC's intramural research and development efforts for fielding in future biodetection efforts.

Attendees from the government, industry, and academia were represented. Each participant discussed current and future



Dr. Shuenn-Jue Wu, a senior scientist at the Naval Medical Research Center participates in collaborator meeting at the University of Notre Dame to discuss Portable Nanosensor Diagnostics.

needs in diagnostic and molecular sensing technologies from their perspective and outlined their possible involvement in the center. A special panel was held to discuss the challenges inherent in developing new diagnostics for low-resource settings, which is a particular focus of the PANDA ERC. Participants on the panel included Wu, Dr. Jean Claude Kazadi from Catholic

Relief Services and Dr. Michael Lochhead from MBio Diagnostics. They shared the obstacles faced and opportunities afforded to those building new devices for military, humanitarian, and commercial purposes. Wu presented highlights about DoD diagnostics requirements, Army/Navy global research sites, and NMRC's track record for scientific contributions in this field.

Diseases Surveillance in Cambodia

(Continued from page 6)

sites across more than one third of Cambodia, which includes RCAF and RCN military bases. The system is running well, although there is the occasional technical obstacle that needs to be negotiated. The next steps for the project will be to improve report follow-up and to establish a Rapid Response Team capable of investigating disease outbreaks when they occur.



The U.S. Naval Medical Research Unit No. 2 Phnom Penh (NAMRU-2 – PP), in collaboration with the Department of Health, Cambodia Ministry of National Defense (MoND), developed a disease surveillance system using SMS (Short Message Service) technology.

Malaria in Liberia – NAMRU-3 Installs New Molecular Laboratory

From NAMRU-3 public affairs

CAIRO - Malaria remains a serious problem for U.S. Armed Forces stationed in Liberia and Navy Medicine researchers are assisting with surveillance and training efforts. The impact of malaria was made very clear in 2003, when members of a Joint Task Force (JTF) serving in Liberia experienced overall infection rates of 28 percent and members of the 26th Marine Expeditionary Unit (MEU) experienced 44 percent infection rates.

Seven confirmed cases of malaria, including one fatality, occurred among 77 troops from December 2009 to March 2010. An additional eight malaria cases were confirmed through microscopy from April 2010 to September 2011.

In March 2010, AFRICOM requested the assistance of the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) to investigate a malaria outbreak among U.S. service members deployed to Liberia for Operation Onward Liberty. NAMRU-3's Vector Biology Research Program (VBRP), in collaboration with the Liberia Institute of Biomedical Research (LIBR) and the Armed Forces of Liberia (AFL), conducted a large scale surveillance effort to identify the primary malaria vectors and create a distribution prediction map to focus control efforts.



Mr. Lawrence Fakoli (LIBR) processing the first samples in LIBR's newly installed GEIS funded molecular laboratory.



Mrs. Nermeen Fahmy from the U.S. Naval Medical Research Unit No. 3, and Mr. Lawrence Fakoli from the Liberia Institute (LIBR) of Biomedical Research processing samples in LIBR's new molecular laboratory.

And that collaboration continues today. Capt. Buhari Oyofa, NAMRU-3 commanding officer, said, "Conducting research is more than our teams collecting data. As good neighbors, we have to give something that continues to function after our projects are done."

The installation of LIBR's new molecular laboratory will allow for PCR testing on collected specimens in country," Lt. Joseph DiClaro head of VBRP said. "Liberia is still rebuilding its infrastructure and there is little to no information on what febrile illnesses are actually circulating. Hopefully these projects will help fill in the gaps of information."

NAMRU-3 provided vector surveillance equipment, training, and an entomology laboratory to the Armed Forces of Liberia Preventive Medicine Team. Prior to this, NAMRU-3 had given formal insecticide applicator training along with the Navy Entomology Center of Excellence which conducted pest applicator training for LIBR techs, field techs, AFL Preventive

Medicine Techs, and civilians working in pest management.

To expand the AFL Medical Department's capabilities, NAMRU-3's VBRP and Bacteriology and Parasitology Department Research Program conducted advanced training in malaria human diagnostics using microscopy and rapid diagnostic tests in September 2013.

"The AFL had limited to no malaria diagnostic capabilities before NAMRU-3's training. These types of skills help us to be able to continue our research and mission," said DiClaro.

NAMRU-3's FY14 malaria surveillance project will examine the prevalence of malaria among the Armed Forces of Liberia before and after vector control measures. This project will capture population data that is often missed in the annual malaria reports and will also increase the AFL malaria diagnostic capability.

Navy/Army Collaborative Efforts Improve Maxillofacial Osteogenesis Understanding

By Rene Alvarez, NAMRU-San Antonio

SAN ANTONIO, Texas - Warfighter Personal Protection Equipment has improved significantly over the last ten years, leading to fewer torso and limb injuries, but leaving the head and neck region extremely vulnerable. When wearing personal protection equipment, the most common injury experienced after exposure to improvised explosive devices, mortars, rocket-propelled grenades, and gunshots is severely fractured or obliterated bones in the maxillofacial areas.

A collaboration, begun in June 2013, between the Naval Medical Research Unit – San Antonio (NAMRU-SA) and the U.S. Army Dental and Trauma Research Detachment (USADTRD), will bring

together a team to study the underlying mechanisms of maxillofacial bone regeneration and identification of specific infections often associated with maxillofacial injuries. This study leverages the extensive expertise of USADTRD with maxillofacial trauma models and NAMRU-SA's experience and capabilities in immunodiagnostics and inflammation. The team's long term goal is focused on the identification of immune biomarkers that would act as "early identifiers" for infection, the most significant issue facing successful maxillofacial bone regenerations.

Unfortunately, there is a limited understanding of the osteogenesis process in the maxillofacial area, which differs significantly from long bone healing. One

key parameter appears to be the role of inflammation associated with the immediate wound, and more importantly, with the kinetics of bone regenerations. This collaborative effort aims to evaluate the foundational profile of the inflammation response associated with maxillofacial osteogenesis at both the protein and mRNA levels, which will serve as the basis of biomarker identification.

The study's findings will be utilized to improve both the development of novel osteogenesis therapeutics and improvement in standard of care for wounded warfighters.



The joint team members of the Naval Medical Research Unit—San Antonio and the U.S. Army Dental and Trauma Research Detachment in front of the Battlefield Health and Trauma building at Joint Base San Antonio Fort San Houston.

NMRC and NEPMU-6 Team Up to Support Disease Surveillance After Typhoon Haiyan

SILVER SPRING, Md. –The expertise of the infectious diseases research team at the Naval Medical Research Center (NMRC) is an invaluable resource and this team can deliver laboratory grade assays for surveillance and public health applications. Recently, NMRC and the Navy Environmental Preventive Medicine Unit Six (NEPMU-6), a field activity of the Navy and Marine Corps Public Health Center, came together during the aftermath of the devastating typhoon Haiyan in the Philippines.

Lt. Cmdr. Chadwick Yasuda, a NEPMU-6 microbiologist, planned to deploy with the Joint Biological Agent Identification and Diagnostic System (JBAIDS) PCR platform to perform specialized tests to identify infectious diseases for public health and surveillance purposes.

However, the system did not have reagents for three projected disease threats: Dengue, Malaria, and Chikungunya. It took only 72 hours from the time Yasuda contacted NMRC until the assays, controls, and protocols were shipped and validated in Hawaii by NEPMU-6.

This live exercise can be seen as a proof-of-concept, wherein future units can utilize NMRC's science base to fulfill their operational needs for research grade diagnostics.

NMRC's menu of assays can also be further expanded to reflect the needs of the field, though many of the most common diagnostic tests that already exist in research groups at NMRC.

For new pathogens encountered, NMRC scientists may be able to design primers, probes and protocols for deployed PCR instruments upon request. These assays can then be validated in real-time at the source of the outbreak.

Finally, the reagents may be lyophilized, pre-aliquoted, and validated using quality systems available within the Navy Medicine R&D enterprise. Overall, both NMRC and NEPMU-6 are very excited about this initial capability demonstration and hope to expand its benefits in years to come.

The JBAIDS System was created to provide rapid positive identification and diagnostic confirmation of biological warfare agents and other pathogens of operational concerns for the Army, Navy, Air Force and Marine Corps.



HM3 Williams, Medical Laboratory Technician at NEPMU-6, prepares the JBAIDS to validate reagents supplied by the NMRC that can identify mosquito borne diseases of Dengue virus, Chikungunya virus, and Malaria in preparation for possible deployment in support of Operation Damayan. NMRC and NEPMU-6 are developing a reagent resource system to increase the capacity at NEPMU-6 to perform disease surveillance and support public health in deployed settings.

2nd Annual Open House: 711 Human Performance Wing and NAMRU-Dayton

From NAMRU-D Public Affairs

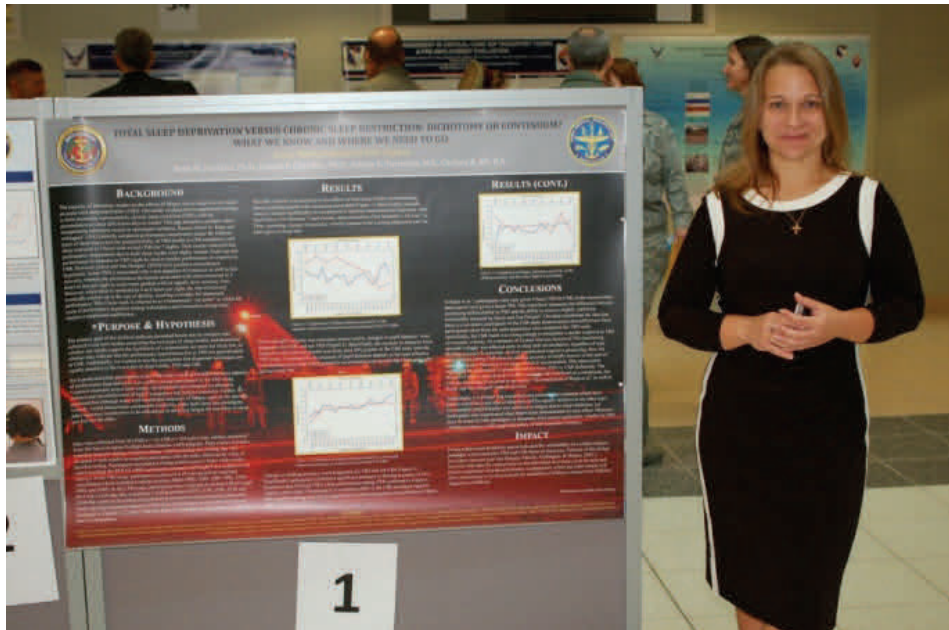
DAYTON, Ohio - The Naval Medical Research Unit Dayton (NAMRU-D) participated in the 2nd Annual 711th Human Performance Wing (711 HPW) + NAMRU Dayton Open House at Wright-Patterson Air Force Base, October 30, 2013.

The open house emphasized collaborative efforts in military medicine research.

The open house included tours of the NAMRU-D Environmental Health Effects Directorate which included stops in the submariner health atmospheres inhalation lab, the jet fuel plus noise inhalation exposure systems lab, the neurobehavioral assessment lab, the electrophysiology program, and the *in vitro* toxicology laboratory.

Tours of NAMRU-D's Aeromedical Directorate facilities included stops in the hypoxia lab, fatigue lab, spatial disorientation countermeasures lab, and the disorientation research device.

Colonel Cassie Barlow, 88th Air Base Wing and Installation Commander, Wright-Patterson AFB, toured NAMRU-D spaces in addition to the Air Force labs and was escorted by Lt. Cmdr. Will



Dr. Beth Hartzler presents her team's research on total sleep deprivation versus chronic sleep restrictions at the 2nd Annual 711 HPW + NAMRU-D Open House poster session.

Wells, Biomedical Sciences Department Head, NAMRU-D.

More than 25 unique programs were highlighted in the areas of human

performance, aerospace medicine, and toxicology.

Over 300 people attended this year's day-long open house which included a poster session for researchers to present published studies in the atrium of the U.S. Air Force School of Aerospace.

Brigadier General Timothy T. Jex, Commander, 711 HPW, and Captain Jeffrey M. Andrews, Commanding Officer, NAMRU-D, encouraged the annual event as it serves as a platform for exchanges of knowledge to improve the lives of our warfighters.

Overall, the 2nd Annual 711 HPW + NAMRU-D Open House was a success and informed tour attendees of the mission-essential work being conducted.



Dr. Lisa Sweeney answers questions at the NAMRU-D display at the 2nd Annual 711 HPW + NAMRU-D Open House poster session.

Recovery of Performance Following Hypoxic Exposure

Dr. Matthew Funke and Dr. Leslie Drummond, NAMRU-Dayton

DAYTON, Ohio - Flight safety continues to be a top priority at the Naval Medical Research Unit – Dayton (NAMRU-D). Over the past decade, in-flight hypoxic events have increased leading to four Class A mishaps that claimed the lives of four pilots and cost over \$300 million in lost aircraft.

For the past several years, a significant portion of NAMRU-D's research has focused on the cognitive deficits experienced by pilots and aircrew when presented with hypoxic stress and how that type of stressor affects flight performance.

Research has established that cognitive and perceptual performance of study participants does not return to baseline levels for up to 24 hours after hypoxic stress. It is not known how much time is needed for normal cognitive functioning to recover from such an exposure. Current practice and treatment in flight assumes that when physiological recovery (e.g., blood oxygenation, heart rate, etc.) is complete, cognitive functioning also returns to normal. However, research conducted at NAMRU-D indicated that is likely not the case.

A study currently underway will follow participants for a significantly longer period of time after exposure to pinpoint when cognitive functioning returns to baseline levels. The participants will be exposed to varying simulated altitudes while performing several iterations of reaction time and perceptual tasks and will



NMRC-Dayton Researcher tests the X-Plane flight simulator used during hypoxic exposure research.

continue to be monitored and tested for the ensuing four hours.

This study will also examine the effect that a five minute treatment with 100 percent oxygen has on the protracted recovery periods observed in prior studies. If results show participants' performance levels remain impaired after breathing 100 percent oxygen it would imply that following hypoxia exposure operators remain significantly impaired throughout

the remainder of the flight. In such a case, the current practice of treating hypoxia with 100 percent oxygen after symptoms present themselves should be replaced for an approach that detects and mitigates hypoxia prior to symptom onset.

Improving aviation safety through hypoxia mitigation continues to be a goal of the research program at NAMRU-D and researchers are investigating this and other factors related to hypoxia.

NAMRU-6 Change of Command

(Continued from page 5)

commanding officer of the Naval Medical Research Center, and Rear Admiral Eduardo Novoa, Peruvian Navy Surgeon General. For the ship's First Officer, I was blessed to be teamed with one of the brightest physicians in Navy Medicine, Capt. Kyle Petersen. As NAMRU-6's Executive Officer he set a tempo and tone

for the crew that left no questions about expectations of performance or the execution of details. With the experience he has gained it is clear that he is the right choice to be NAMRU-6's next Master & Commander.

To all my NAMRU-6 shipmates, you followed the Navy ethos as if they were direct orders. You were honorable in your

sense of duty to the science and ethics of human research, courageous and unwavering in the defense of the health of your countrymen, and absolutely committed to the victory of our critical research mission. It was a privilege to serve with you on the NAMRU-6 ship, and an honor to be your commanding officer.

Naval Medical Research Center Participates in the 2013 Combined Federal Campaign of the National Capital Area



Front—left to right: Capt. Elizabeth Montcalm-Smith, NMRC Executive Officer; Capt. John Sanders, NMRC Commanding Officer; HMC Jerry Diederich, NMRC Command Chief. Back—left to right: NMRC CFC Key Persons. Lt. James Regeimbal, Lt. Melissa Laird, Lt. Rebecca Pavlicek; Lt. Kimberly Edgel, Lt. Jose Garcia, HM1 Latanya Brown, HM2 Kyle OldKnow.

SILVER SPRING – The Naval Medical Research Center's (NMRC) Commanding Officer, Executive Officer, and Command Chief kicked off the 2013 Combined Federal Campaign of the National Capital Area campaign by pledging donations.

The campaign will continue until January 15, 2014. The Combined Federal Campaign is the largest and most successful workplace fundraising campaign

in the world. Over the past fifty years, the CFC has raised \$7 billion to help neighbors in need around the corner, across the nation and throughout the world. The Combined Federal Campaign of the National Capital Area (CFCNCA) is the local campaign for federal employees in the Washington Metropolitan Area. Through the CFCNCA, federal employees have the opportunity to donate to more than 4,400

approved local, national and international charities. See the complete list of participating charities in the 2013 Catalog of Caring (<http://www.cfcncnca.org/about-cfcncnca>).

In 2012, 130,000 federal employees made this success possible by raising nearly \$62 million – funds that provided promising futures, an improved world, and better communities.

The CFC today is known to be the most inclusive workplace giving campaign in the world with the number of participating charities estimated at over 20,000 nonprofit charitable organizations worldwide.

The charities supported through the CFC range from nascent community groups to large, well-known charities. Partnerships with nonprofit organizations are a core

part of the CFC structure. In each of the 320 CFC areas throughout the country, local and national nonprofit organizations collaborate closely with committees of Federal campaign workers to design marketing strategies for the campaign and to process the receipt and distribution of Federal employee contributions to the charities they choose.

CFC also directly involves participating nonprofit organization leaders in the design of new policies and programs that are shaping the future of the Combined Federal Campaign. These partnerships are promoting greater direct giving from Federal employees to local and national nonprofits while helping nonprofit organizations use these contributions to leverage financial resources from other sources.

Navy Medicine R&D Honors its 2013 Sailor of the Year

SILVER SPRING – Hospital Corpsman First Class (DV/EXW) John Connors from the Naval Submarine Medical Research Laboratory (NSMRL) in Groton, Conn. was selected as the 2013 Navy Medicine Research & Development Sailor of the Year (SOY).

HM1 Connors was selected by a panel of Navy Medicine R&D senior enlisted from the Naval Medical Research Center; Naval Submarine Medical Research Laboratory; NMRC-Asia, Singapore; and U.S. Naval Medical Research Unit-3, Cairo.

Connors is the leading petty officer for the Operations Department at NSMRL. Connors is recognized for his performance as an outstanding leader and mentor for seven enlisted and eight officers. He sought out opportunities for Sailors to become more integrated with the research conducted at NSMRL. He personally supervised over 30 hours of manned altitude chamber operations and 30 hours of diving operations, with no mishaps or near-misses. He oversaw and trained junior personnel in safe hyperbaric and hypobaric chamber operations.

As the Command Career Counselor, he developed an intrusive career development and mentorship program. He ensured that personnel were trained on current DAPA issues and proactively ensured that Sailors had resources available. Connors volunteered as a research subject for five research protocols and assisted in several other research programs both as a research assistant and subject matter expert.

In December, Connors competed for BUMED Headquarters SOY. The winner of the BUMED Headquarters SOY, HM1 Eusebio from NEPMU-5, will compete for the Navy Medicine SOY.



Greetings from the NMRC Ombudsman!

Greetings All,

I'd like to thank Alex Mora, the outgoing Ombudsman, for her efforts this past year and wish her and her spouse fair winds and following seas as they go on to their next command. I'm very excited for the opportunity to serve as the Ombudsman and hope that I can provide help, support, and maybe even a little levity to those who need it. Having held down the homefront through my husband's deployments, I know the power of having a fellow Navy spouse to lean on and I've learned that even though it's our spouses who wear the uniform, we have all chosen to serve.

I hope that you'll use my little corner of the newsletter as a resource and if you have any questions or concerns, or if you just need someone to talk to, please don't hesitate to reach out to me at alliehnorris@gmail.com or 817-504-2946. From my family to yours, I wish you a happy and healthy holiday season! Have a great Navy day!

Allison Norris

